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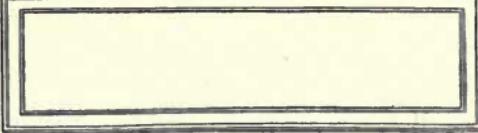
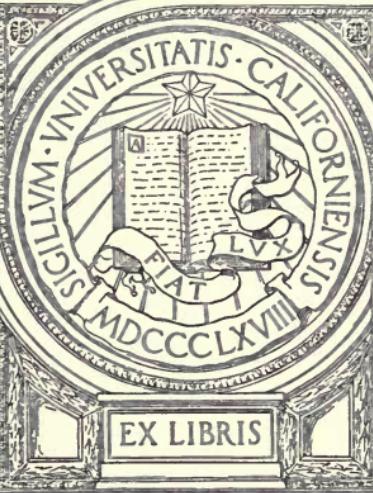
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LETTER

FROM

THE ACTING SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE ACTING CHIEF OF ENGINEERS, REPORTS ON EXAMINATION AND SURVEY OF TOTUSKEY RIVER, VIRGINIA, FROM DEEP WATER IN RAPPAHANNOCK RIVER TO THE BRIDGE ABOUT 5 MILES ABOVE ITS MOUTH.

MARCH 31, 1910.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington, March 30, 1910.

SIR: I have the honor to transmit herewith a letter from the Acting Chief of Engineers, U. S. Army, dated 29th instant, together with copies of reports from Maj. Jay J. Morrow, Corps of Engineers, dated May 10, 1909, and January 7, 1910, on preliminary examination and survey, respectively, of Totuskey River, Virginia, made by him in compliance with the provisions of the river and harbor act of March 3, 1909.

Very respectfully,

ROBERT SHAW OLIVER,
Acting Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 29, 1910.

SIR: I have the honor to submit herewith, for transmission to Congress, reports dated May 10, 1909, and January 7, 1910, by Maj. Jay J. Morrow, Corps of Engineers, on preliminary examination and survey, respectively, called for by the river and harbor act approved March 3, 1909, of Totuskey River, Virginia, from deep water in Rappahannock River to the bridge about 5 miles above its mouth.

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This locality has been under improvement by the General Government, 2,117 feet of longitudinal log dike having been constructed at Bookers bar in 1883. The district officer submits several plans for further improvement, ranging in cost from \$11,600 to \$57,500, but in view of the limited benefits to navigation which would result, as compared with the initial cost, he expresses the opinion that the proposed improvement is not worthy of being undertaken by the General Government, and this opinion is concurred in by the division engineer.

These reports have been considered by the Board of Engineers for Rivers and Harbors, which states in its report dated February 14, 1910, herewith, that the cost of improving this stream by any of the methods suggested would be disproportionate to the probable resulting benefits and that it is inadvisable for the General Government to undertake the work.

I concur in the views of the Board of Engineers for Rivers and Harbors.

Very respectfully,

FREDERIC V. ABBOT,
Acting Chief of Engineers.

The SECRETARY OF WAR.

PRELIMINARY EXAMINATION OF TOTUSKEY RIVER, VIRGINIA.

UNITED STATES ENGINEER OFFICE,
Washington, D. C., May 10, 1909.

SIR: In accordance with orders from the Chief of Engineers, I have the honor to submit the following report of a preliminary examination of Totuskey River from deep water in Rappahannock River to the bridge about 5 miles above its mouth, made in compliance with the requirements of the river and harbor act of March 3, 1909.

The examination was made April 27, 1909, by Assistant Engineer William B. Harrison, under instructions from me. On that day he had conferences at Warsaw, Va., with several prominent citizens interested in the proposed improvement.

A preliminary examination was made of this same stream, under direction of Maj. Spencer Cosby, Corps of Engineers, by Assistant Engineer F. C. Warman, in April, 1907, in compliance with the river and harbor act of March 2, 1907. Mr. Harrison's report follows closely the lines of the former report (published in H. Doc. No. 451, 60th Cong., 1st sess.), but contains such modifications and additions as were brought out by the examination.

The following is from Mr. Harrison's report:

General description.—Totuskey River rises on the boundary of Northumberland and Richmond counties, Va., flows in a southwesterly direction through Richmond County, and empties into Rappahannock River 35 miles above its mouth (Chesapeake Bay) and 7 miles below Tappahannock. The total length of Totuskey River is about 15 miles, and the country through which it flows and drains, about 36 square miles, is undulating and fertile. The principal settlements in this area are Warsaw, with about 275 inhabitants; Haynesville, with 150; Emmerton, with 100; Farnham, with 100; and Lyells, with 75; and the total tributary population is claimed at about 3,000 persons to the area of only 36 square miles. This estimate is thought to be excessive, as the 1900 census gives the population of the whole of Richmond County, 210 square miles, as only 7,088. The residents of this section of the country are chiefly engaged in lumbering, agricultural pursuits, and canning. There are 18 stores in the area.

This stream is not believed to have any water power or terminal possibilities. For the first 5 miles above its mouth it has the characteristics of a tidal estuary, with a

mean range of tide of about 2 feet and no appreciable slope. The water is usually fresh. The stream is bordered by high banks, varying from 300 feet to 600 feet apart and averaging about 400 feet apart. Between the high banks extensive marshes exist, alternating from bank to bank, reducing the water widths to an average of about 200 feet above and about 500 feet below Bookers bar and making the navigable channel extremely tortuous.

The "Northern Neck Road," connecting Fredericksburg, Va., with Chesapeake Bay, bridges the stream about 5 miles above its mouth. The bridge is a low structure without a draw, which limits navigation above it to small lighters. The stream forks into two branches about 100 yards above the bridge, and it is said that lighter navigation is available up the branches for the distances of 2 and 6 miles, respectively. The bridge is the head of the desired improvement.

There are two boat landings maintained on this stream; the one at North Bend, about one-half mile below Bookers bar, is simply a precipitous bank with sufficient adjacent depth of water for boats to land; the other, at the bridge, has two small timber wharves and one earthen landing. Other landings are available and are occasionally used at such points along the stream where the channel winds close in to the high banks. The landing and wharf facilities are adequate for the present and future needs of commerce of the stream. No vessels were in the stream on April 27.

The tributary area is about two-thirds cultivated and one-third wooded, principally with pine. The soil is fertile and the locality is well adapted for trucking if quick transportation facilities were available. Fifteen bushels of wheat are usually raised per acre, though some parts of this section yield as high as 35 bushels.

There are no railroads accessible and all shipments are necessarily made by water. Wellfords wharf on the Rappahannock River is situated about two-thirds of a mile above its mouth, about $5\frac{1}{2}$ miles from Warsaw, the principal settlements of the tributary area, whereas the bridge, the head of the proposed improvement, is about 3 miles from Warsaw, 9 miles from Wellford or Sharps wharf on the Rappahannock River, 11 miles from Kingsale, 8 miles from Hyacinth, and 10 miles from Lodge wharves, all on the Potomac River. Some of these places, the nearest points touched by the regular line of steamers, are still nearer to that portion of the tributary area located above the bridge.

Previous examinations and operations.—An examination of Totuskey River was made in 1874. The obstructions to navigation were found to consist of a bar at the mouth, which forms a part of the wide flat between the outlet of the stream and the navigable channel of the Rappahannock, having a ruling depth of $4\frac{1}{2}$ feet, and a bar about $2\frac{1}{2}$ miles above the mouth, known as Bookers bar, having a ruling depth of 3 feet. It was at this time proposed to dredge a channel 60 feet wide and 8 feet deep through Bookers bar, to construct a dike at this bar at an estimated cost of \$14,960, and to omit work on the bar at the mouth.

Between June 14, 1880, and August 2, 1882, \$10,000 was appropriated for this improvement, and this sum was expended in constructing a longitudinal log dike 2,117 feet long at Bookers bar, which was completed in 1883.

In 1881 a detailed survey was made of both bars and a channel 100 feet wide and 8 feet deep through the bar at the mouth was added to the project, the estimated cost of which was increased to \$33,745.03. In 1884 the improvement of the bar at the mouth was dropped from the project and the estimated cost reduced to \$21,312.

This stream was carried on the list of improvements until 1890, when, no additional appropriations having been made by Congress, it was dropped. As far as is known no work of improvement has ever been done by private parties.

Channel depths and obstructions to 8-foot navigation.—The depth immediately below the bridge is about 18 feet and the width between low-water lines is about 150 feet. To make a turning basin for large steamers at this point of 250 feet width would require a cut of about 100 feet into the marsh. The ruling depth from the bridge to the upper end of Bookers bar is 10 feet, with the exception of a small bar (Strawberry Hill bar) having the length of about 500 feet and the ruling depth of about 5 feet and located in the channel crossing about one-half mile below the bridge. The depths from the upper end of Bookers bar to the deep water in the Rappahannock River, a distance of about $3\frac{1}{2}$ miles, vary from $3\frac{1}{2}$ to 12 feet, and fully three-fourths of that distance, or about $2\frac{1}{2}$ miles, has less than 8-foot depth. The shoalest bars found in this reach are as follows:

The bar at the mouth of the creek is a wide mud flat, and extends out to deep water in Rappahannock River, a distance of about 1 mile. The depth over this bar varies from $4\frac{1}{2}$ to 5 feet at low tide. It is part of an extensive flat in the Rappahannock, and has probably been formed by tidal action, in the main independent of freshet deposits from Totuskey River, though they have probably contributed somewhat to its formation.

About one-half of a mile inside the mouth of the creek a mud bar is encountered about 500 feet long, with a ruling depth of about 5 feet at low tide.

Coolspring bar, about 2 miles above the mouth of the river, is a mud bar about 1,000 feet long, with a ruling depth of about 4 feet at low tide.

Bookers bar, about $2\frac{1}{2}$ miles above the mouth, is the most serious obstruction to navigation in the stream. The bar is caused by a sudden expansion of the river from about 200 feet to about 900 feet, and also because it is a point of crossing of the channel from one bank to the other. The dike which was constructed in 1883, although in need of some repair, has effectually reduced the width at this point, and the ruling depth over the bar is now about $3\frac{1}{2}$ feet at low tide, which is half a foot greater than it was in 1874. This increase in depth is due to vessels dragging through the mud and to the effect of the dike. This bar is composed of soft mud and is about 3,000 feet long.

Improvement desired.—A channel 10 feet deep at low tide, 100 feet wide, and wider at the turns, with a turning basin at Totuskey bridge is requested to permit of navigation of the stream by the regular line of steamers plying the Rappahannock River, and if this improvement can not be obtained it is stated that a channel 8 feet deep at low tide and 80 feet wide and wider at the turns, with a turning basin, would afford the community great relief, and would provide all the facilities required by sailing vessels and barges. The longest barge now navigating the stream is 178 feet long. A turning basin to accommodate the regular line of steamers plying the Rappahannock River should be at least 250 feet wide, but to accommodate the vessels and barges now plying the stream 200 feet wide would be sufficient.

The dike at Bookers bar would require repair, and a jetty would be needed across the mud flat at the mouth to maintain the depth obtained by dredging. Although partly sheltered behind Accaceek Point this jetty would have to be very substantially built to resist the action of ice in Rappahannock River.

If these jetties were constructed it is thought that the cost of maintaining the channel would be comparatively small.

Present commerce.—At present commerce is carried on in bugeyes, schooners, and barges of from 10 to 250 gross tons, and shipments are made chiefly to Baltimore, Norfolk, Philadelphia, and Elkton, Md. The principal articles of commerce are lumber, wood, railroad ties, grain, farm produce, coal, ice, canned fruits and vegetables, flour, oysters, and general merchandise.

During 1906 the receipts and shipments amounted to about 17,600 tons, and were estimated to be worth about \$282,000. The shipments are reported to have increased about 10 per cent since 1906, and to be increasing from year to year, especially those of canned goods and wood for pulp. There is no passenger traffic on Totuskey River at present, as all passengers go to the steamer wharves on the Rappahannock and Potomac rivers. Two vessels belong in Totuskey. At the present time the larger vessels can take but a portion of their cargoes in the stream and then drop out to deep water in the Rappahannock, where the remainder of the load is lightered out to them.

Prospective commerce and benefits.—On account of the difficulties and uncertainties of navigation in Totuskey River the freight rate on lumber is 50 cents per 1,000 feet b. m. more for lumber delivered inside the river than at neighboring wharves on the Rappahannock and its deeper tributaries, and it is very difficult even then to get vessels when wanted. The rates on other articles are in proportion. If the channels were improved, a reduction in freight rates is anticipated, and also greater facility in securing vessels. Shipments could be made in vessels of greater capacity. Much produce which is now shipped by steamers would be shipped by sail vessels at greatly reduced rates, and the haul over the country roads would be greatly reduced.

It is claimed that truck-garden produce can be raised here as easily as in the vicinity of Norfolk, and if the steamers entered the stream this industry would develop greatly.

On the occasion of the examination of 1907 Major Cosby recommended unfavorable action, but it was clearly stated in the report that such report was demanded, by the language of the act which contemplated the improvement over but one bar of several which obstructed navigation, and that the removal of the one bar would be of little, if any, advantage to navigation in the absence of work on the remaining obstructions.

The examination just completed has been sufficient to demonstrate that any project to improve the stream for the navigation of the regular line of steamers plying Rappahannock River is neither practicable

nor advisable, as it would require dredging over almost the entire length of the stream to obtain the widths, depths, and alignment necessary, its cost being out of proportion to the benefits to be derived from the work.

The country is, however, without railroad facilities, and is entirely dependent upon water transportation, and it is possible that it may be found upon further examination that an improvement of the stream upon an 8-foot basis, or some lesser depth, would materially improve the transportation facilities at a cost commensurate with the commerce involved. It is believed that a survey to this end should be made, and it is accordingly recommended, at an estimated cost of \$700.

Very respectfully,

JAY J. MORROW,
Major, Corps of Engineers.

The CHIEF OF ENGINEERS, U. S. ARMY.
(Through the Division Engineer.)

[First indorsement.]

U. S. ENGINEER OFFICE, EASTERN DIVISION,
New York City, May 12, 1909.

Respectfully forwarded to the Chief of Engineers, U. S. Army.

While the amount of commerce and the general character of the country adjacent to the stream would appear to indicate that only a very limited improvement would be justifiable at best, I concur with the district officer in recommending a survey to determine whether it is possible to improve the transportation facilities at a cost commensurate with the commerce involved.

D. W. LOCKWOOD,
*Colonel, Corps of Engineers,
Division Engineer.*

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., May 25, 1909.

Respectfully returned to the Chief of Engineers, U. S. Army.

The district officer states that a radical improvement of this stream is neither practicable nor advisable on account of the extent and cost of the work involved. He believes, however, that a further investigation involving a survey should be made to determine whether any moderate improvement could be effected at a cost commensurate with the commerce involved. The division engineer is in accord with the views of the district officer.

In view of the fact that the locality is entirely dependent upon water transportation and that the cost necessary to determine the practicability and advisability of the improvement is not great, the Board believes the locality worthy of consideration to this extent, and therefore recommends that the survey proposed by the district officer be authorized.

For the Board:

JOHN G. D. KNIGHT,
*Colonel, Corps of Engineers,
Senior Member Present.*

[Fourth indorsement.]

WAR DEPARTMENT,
 OFFICE OF THE CHIEF OF ENGINEERS,
 Washington, June 2, 1909.

Respectfully submitted to the Secretary of War.

This is a report on preliminary examination of Totuskey River, Virginia, authorized by the river and harbor act of March 3, 1909.

Inviting attention to the report of the Board of Engineers for Rivers and Harbors in the preceding indorsement, I recommend that a survey of the locality, as proposed, be authorized.

W. L. MARSHALL,
Chief of Engineers, U. S. Army.

[Fifth Indorsement.]

WAR DEPARTMENT, June 3, 1909.

Approved as recommended by the Chief of Engineers.

ROBERT SHAW OLIVER,
Assistant Secretary of War.

SURVEY OF TOTUSKEY RIVER, VIRGINIA.

UNITED STATES ENGINEER OFFICE,
 Washington, D. C., January 7, 1910.

SIR: In compliance with orders contained in department letter of June 9, 1909, I have the honor to submit the following report on the survey of Totuskey River, Virginia, from deep water in the Rappahannock River to the bridge, about 5 miles above its mouth, made in compliance with the requirements of the river and harbor act of March 3, 1909.

The survey was made in October, 1909, by Assistant Engineer John Krey. A full description of the locality and conditions of the stream are given in my report on the preliminary examination dated May 10, 1909. Supplementary information obtained during the survey is noted in full on map accompanying.^a

Estimates have been prepared on the basis of channels of 8 feet and 6 feet depth, and of 100 feet and 80 feet width through all of the bars between the Rappahannock River and the bridge about 5 miles above the mouth of Totuskey River. The names of the bars encountered in the two projects for 8 and 6 foot navigation, with the estimated quantities of excavation, are shown in tabulated form as follows:

Eight-foot project.

Bars.	Center of bar below bridge.	Length in feet.	Depth in feet.		Estimate.	
			Ruling.	Average.	For channel 100 feet wide.	For channel 80 feet wide.
Strawberry Hill.....	Miles.	700	6.6	7.0	Cu. yds. 6,200	Cu. yds. 5,200
Bookers.....	0.8	2,100	5.0	5.9	29,000	24,100
Cool Spring.....	1.9	4,300	5.8	6.8	42,000	35,000
Phillips.....	2.6	2,200	7.2	7.5	14,600	12,200
Shipyard.....	3.5	1,200	5.5	6.8	11,800	9,800
Mouth.....	5.3	5,100	4.5	5.0	90,700	75,600
Total 6 bars.....		15,600	194,800	161,900

^a Not printed.

Six-foot project.

Bars.	Center of bar below bridge.	Length in feet.	Depth in feet.		Estimate.	
			Ruling.	Average.	For channel 100 feet wide.	For channel 80 feet wide.
Bookers.....	1.9	1,600	5.0	5.6	10,000	8,300
Cool Spring.....	2.6	1,100	5.0	5.7	6,400	5,300
Shipyard.....	4.1	600	5.4	5.8	3,200	2,700
Mouth.....	5.4	4,600	4.5	5.0	41,000	34,100
Total 4 bars.....		7,900			60,600	50,400

The estimated costs for the work along the four projects, with the estimated costs of annual maintenance, are shown in tabulated form as follows:

One hundred feet wide and 8 feet deep.

194,300 cubic yards of dredging, at 20 cents per cubic yard.....	\$38,860
Engineering and contingencies, about 15 per cent.....	5,840
Total	44,700

Maintenance, \$5,000 yearly.

One hundred feet wide and 6 feet deep.

60,600 cubic yards of dredging, at 20 cents per cubic yard.....	\$12,120
Engineering and contingencies, about 15 per cent.....	1,880
Total	14,000

Maintenance, \$2,500 yearly.

Eighty feet wide and 8 feet deep.

161,900 cubic yards of dredging, at 20 cents per cubic yard.....	\$32,380
Engineering and contingencies, about 15 per cent.....	4,820
Total	37,200

Maintenance, \$4,000 yearly.

Eighty feet wide and 6 feet deep.

50,400 cubic yards of dredging, at 20 cents per cubic yard.....	\$10,080
Engineering and contingencies, about 15 per cent.....	1,520
Total	11,600

Maintenance, \$1,800 yearly.

An estimate also is prepared for providing a channel 6 feet deep and 80 feet wide throughout, excepting that the width is increased to 130 feet through the bar at the mouth of the river. The estimate for this channel and for annual maintenance thereof is as follows:

	Cubic yards.
130 feet through mouth bar.....	75,900
80 feet through other bars.....	16,300
Total	92,200
92,200 cubic yards of dredging, at 20 cents per cubic yard.....	18,440
Engineering and contingencies, about 15 per cent.....	2,760
Total	21,200
Maintenance, \$3,000 yearly.	

As stated in the preliminary report, and as shown in the preceding estimates, the most serious difficulty connected with a project for the improvement of navigation in this stream is the wide bar at the mouth across the mud flats in the Rappahannock River, and it is believed that most of the work of maintenance will be required to maintain the channel across this flat. It is estimated that the maintenance cost in each of the foregoing projects could be reduced to about one-fifth respectively of the estimated amounts by the addition of a riprap jetty across these flats for the protection of the channel across the flat called "Mouth bar." The estimated cost of the jetty, about 5,000 feet in length and containing about 20,000 cubic yards of riprap, including an allowance of 15 per cent for engineering and contingencies, is \$57,500.

There are no questions of terminal facilities, development of water power, or any other similar subject which require consideration in connection with the survey and report.

In view of the high initial cost and heavy maintenance charges for any improvement on the stream, and the limited benefits to navigation as compared therewith, I am of opinion that Totuskey River is not worthy of improvement by the General Government at this time with a view to increasing the depth from the Rappahannock River to the bridge about 5 miles above its mouth.

Very respectfully,

JAY J. MORROW,
Major, Corps of Engineers.

The CHIEF OF ENGINEERS, U. S. ARMY.

(Through the Division Engineer.)

[First indorsement.]

U. S. ENGINEER OFFICE, EASTERN DIVISION,
New York City, January 13, 1910.

Respectfully forwarded to the Chief of Engineers, U. S. Army, concurring in the views and recommendations of the district officer.

W. M. T. ROSELL,
Colonel, Corps of Engineers,
Division Engineer.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., February 14, 1910.

Respectfully returned to the Chief of Engineers, U. S. Army.

Based on the results of the survey, the district officer submits estimates for channels of varying widths and depths as follows:

Width.	Depth.	Esti- mated cost.	Esti- mated main- tenance.
	<i>Feet.</i>		
100 feet	8	\$44,700	\$5,000
80 feet	8	37,200	4,000
100 feet	6	14,000	2,500
80 feet	6	11,600	1,800
80 feet in river, 130 feet over bar at mouth	6	21,200	3,000

An estimate is also submitted in the sum of \$57,500 for a jetty about 5,000 feet in length over the bar at the mouth of the river. Such a jetty, it is thought, would materially reduce the cost of maintenance of any of the above channels. On account of the comparatively large first cost and subsequent maintenance, the district officer is of opinion that the improvement of this stream is not justified, and in this view the division engineer concurs.

It is reported that there are some five villages in the vicinity of the proposed improvement having a population of about 100 to 275 each, and that the total population tributary is about 3,000. The commerce reported is of a miscellaneous character, amounting to about 17,600 tons. The principal obstacle to navigation is a wide, flat bar at the mouth of the river, having over it a depth of only 4 to 5 feet for a distance of about three-fourths of a mile. The maintenance of a channel through this bar would require either the construction of a jetty or frequent dredging over the entire distance. In the first case the cost is prohibitive, and in the second the channel would not be reliable, and consequently not of sufficient value to justify the cost.

The Board is of opinion that the cost of improving this stream by any of the methods suggested would be disproportionate to the probable resulting benefits, and therefore it concurs with the district officer and the division engineer in believing it to be inadvisable for the General Government to undertake the work.

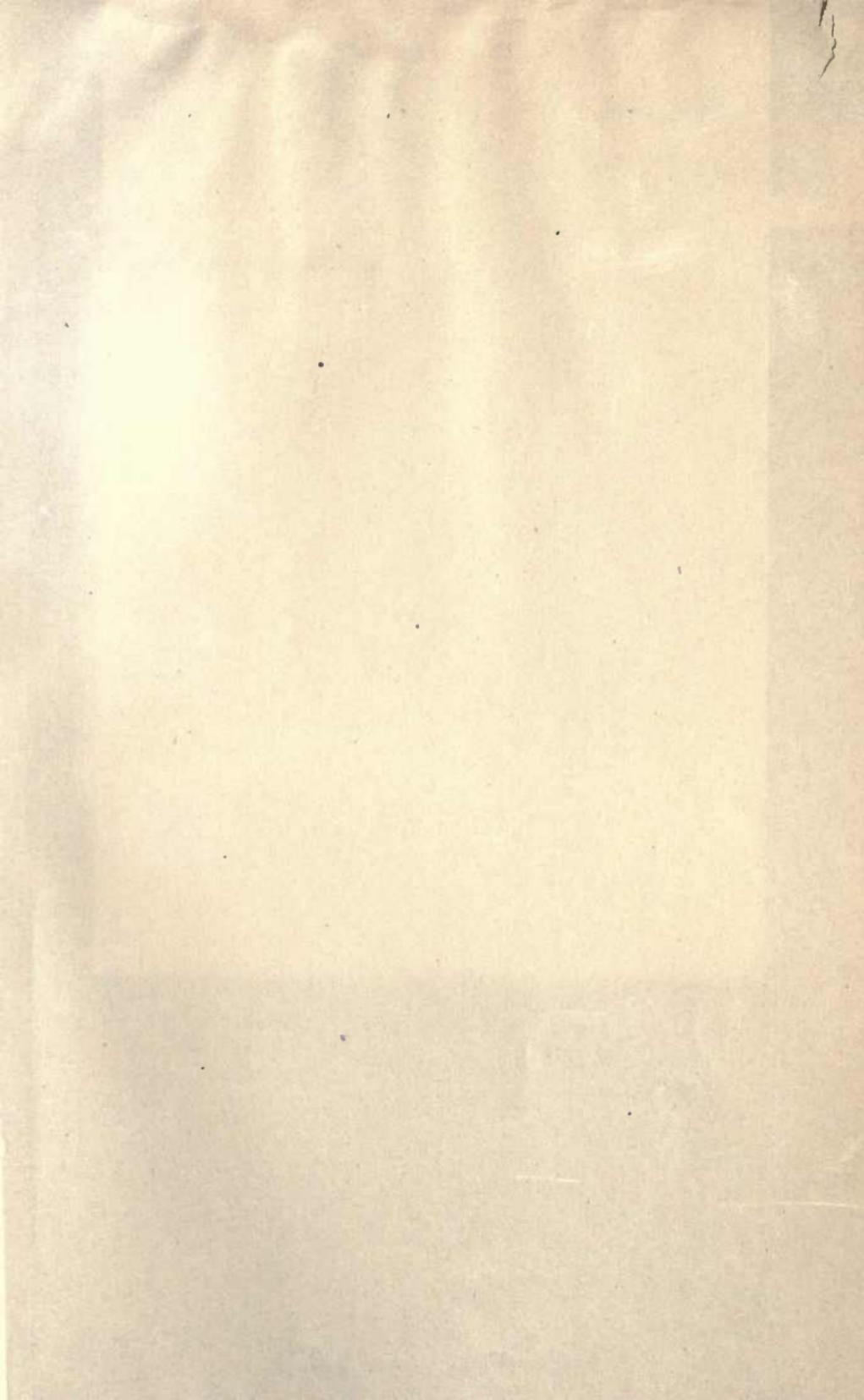
Interested parties were notified of the adverse report of the district officer and invited to submit their views to the Board, but no communications have been received.

In compliance with the provisions of section 13 of the act of March 3, 1909, the Board reports that there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the Board:

W. C. LANGFITT,
Lieut. Col., *Corps of Engineers,*
Senior Member Present.

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